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eRHIC collider design status

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We present the design of future high-energy high-luminosity electron-hadron collider at RHIC called eRHIC. We plan on adding 20 (potentially 30) GeV energy recovery linacs to accelerate and to collide polarized and unpolarized electrons with hadrons in RHIC. The center-of-mass energy of eRHIC will range from 30 to 200 GeV. The luminosity exceeding $10^{34} \text{ cm}^{-2} \text{ s}^{-1}$ can be achieved in eRHIC using the low-beta interaction region with a 10 mrad crab crossing. We report on the progress of important eRHIC R&D such as the high-current polarized electron source, the coherent electron cooling and the compact magnets for recirculating passes. A natural staging scenario of step-by-step increases of the electron beam energy by building-up of eRHIC's SRF linacs and a potential of adding polarized positrons are also presented.

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